Nebraska Network
TEMPLATE
Overview of Nebraska and other states' Networks

I. Contact Information
   A. Name of Network
   B. Single point of contact
   C. E-mail, Phone, Address
   D. Primary website
II. Network Description
   A. Number and types of clients
      - Public
      - Private
   B. Technology
      - Provider
      - Circuits
      - Capacity
   C. Types of traffic
      - Voice
      - Video
      - Data
   D. Security/Privacy requirements
      - External
      - Internal
      - Filtering Requirements
III. Management & Operations
   A. Network Operations Center
   B. Operations Staff
   C. Technical Support
IV. Governance
   A. Policies
   B. Policy Board or Director
   C. Statutory Authority and Constraints
V. Funding & Billing
   A. Internal Sources of Funding
   B. External Sources of Funding
   C. Cost Schedule of Services

I. COLORADO Contact Information

    A. Name of Network: Colorado Multi-Use Network (MNT)

    B. Single point of contact: Nils Carlson, Chief Technology Officer, Colorado Government Technology Services

    C. E-mail, Phone, Address: nils.carlson@state.co.us, juan.trujillo@state.co.us - *MNT Technical Project Mangers* (303) 239-4313

    D. Primary website: http://www.state.co.us/mnt/

II. Network Description

    A. Number and types of clients

The Colorado Multi-Use Network (MNT) project is a partnership between the State of Colorado and Qwest to build a high-speed fiber-optic network linking rural and urban Colorado. The State will aggregate Colorado State government agency telecommunication requirements from its current multiple networks into a single network to reduce administrative and maintenance costs to the State. As anchor tenant, the State's investment will help leverage the development of telecommunications infrastructure and expand delivery of advanced services to all geographic regions of the state. The MNT will be implemented in three phases that began in June 2000 and will be completed in 2003.

Colorado Telecommunications Infrastructure Fund, most often referred to as the Beanpole Fund, now has 90 Beanpole customers in southeast Colorado that are already using the MNT. This group includes 22 city halls, medical centers, sheriff departments, nursing homes, water and sewer departments and a cemetery. In northwest Colorado, which includes Routt and Moffat Counties, 99 more Beanpole customers are scheduled for full implementation by March 31, 2002. Southwest Colorado is well into their implementation schedule and northeast Colorado is currently engaged in their Request for Proposal (RFP) phase in preparation for their implementation phase of the Beanpole process. An additional 85 public entities have also been aggregated in southeast Colorado and are currently on the MNT Network.

The mandate for infrastructure development is aligned with local economic development based on the availability of advanced telecommunication services. SB 96-197 refers to the selection and operation of a Multiple-use Network. This is defined as a digital network capable of carrying integrated voice and video as well as text, graphics, and other electronic data between and among schools, public libraries, institutions of higher education, and state agencies. The bill mandated that the State investigate and select one or more multiple-use networks to accomplish this.

    B. Technology

Qwest is the awarded partner selected to build the MNT with the State serving as anchor tenant. The project will be conducted in three one-year phases in which 70 Aggregated Network Access Points (ANAPS) will be implemented across the state. An ANAP is defined as a minimum of 20 megabits of access capability for State government network users in an area. This service will be delivered over the new fiber optic network utilizing ATM (Asynchronous Transfer Mode) technology. Forty-three ANAPS have been implemented in Phase I; an additional eleven ANAPS will be implemented in Phase II, year 2002; and the final sixteen ANAPS will be implemented in Phase III, year 2003.

The ANAP locations will ideally be interconnected by Asynchronous Transfer Mode services. ATM allows voice, video and data to be carried over the same circuit with competent delivery of each. ATM at the ANAP interconnection level will provide a high capacity service to carry diverse traffic gathered from local communities. This will be accomplished by purchasing ATM services, preferably operated, over fiber optic facilities. The preference for ATM and fiber based technologies is based on the anticipation of increased demand and ease of upgrade to new services and technologies as they are offered. The essential infrastructure technology to deliver this level of service is Synchronous Optical Network (SONET); a fiber-based technology that is well suited to carry ATM. Another technology, based on copper facilities is DS-3 technology. The DS-3 technology does not have the capability to scale to demand like SONET, but may be used for backbone service in areas lacking fiber optic facilities. The network switches proposed for this project are capable of accommodating either technology for backbone services.

Conventional ANAPS are sites that are used to aggregate community traffic. They will initially be configured to handle 10 to 20 Mbps ATM service. The super ANAPS are sites identified for large capacity backbone connections, up to 155 Mbps (SONET OC-3c data rate) and above. These super ANAP sites were identified as high traffic sites through several analysis criteria. These criteria include preparation for Internet II presence, high potential usage for video applications using network protocols or conventional switching technologies, and additionally to serve as a conventional ANAP. These super ANAP sites use the same technology and architecture as conventional ANAPS, but differ primarily on the amount of bandwidth required. ATM service provided by carriers allows the ANAPS to be connected into a network cloud. This means that once physically connected to the cloud, all other sites within the cloud can be reached. This "cloud" architecture only requires a single connection to reach multiple destinations without regard to routes or paths taken by the data.

C. Types of traffic

Legislative Bill SB 96-197 refers to the selection and operation of a Multiple-use Network. This is defined as a digital network capable of carrying integrated voice and video as well as text, graphics, and other electronic data

D. Security/Privacy requirements

III. Management & Operations

A. Network Operations Center

The State of Colorado does not currently have in place an administrative or management function that could undertake the day-to-day monitoring and operations of a Statewide telecommunications infrastructure described in this plan. Therefore, based on a review of existing resources and through discussions with various stakeholders, the MNT recommends that the State outsource the management and operation of this infrastructure to the private sector.

B. Operations Staff

C. Technical Support

Personal Services: $161,000 per year additional spending authority for 3 additional FTE was proposed. The new FTE are two Network Analysts II and one Programmer Analyst III.

IV. Governance

A. Policies

B. Policy Board

The 13-member Multi-use Network task force was appointed by Governor Bill Owens and meets monthly. This plan proposes that a central authority be established to provide control and oversight of the State network infrastructure. The two primary elements related to this activity include a network oversight authority and development and maintenance of an information/resource clearinghouse. The network oversight authority would exist to coordinate vendor-provided network management and maintenance. Tasks would include: developing network priorities, defining and providing technical standards for contract compliance, vendor relations, contract management and acting as a liaison between the end-user and the telecommunications provider. The information/resource clearinghouse would provide data for the aggregation processes on state and local levels and the gathering and processing of ongoing information about telecommunications activity for improved internal coordination and strategic planning. Currently SB 96-102 (C.R.S. 24-30-1702.5) provides the Commission on Information Management with the authority and responsibility to implement appropriate management of the network. The MNT believes the responsibility and authority to perform this task may more appropriately reside within the Colorado Information Technology Services (CITS) Division of the Department of General Support Services. An interagency board with representation of all participating areas should be utilized to provide ongoing guidance.

C. Statutory Authority and Constraints

V. Funding & Billing

A. Internal Sources of Funding

The charges of 22.58 percent of tariff for frame circuits and 15.58 percent of tariff for ATM circuits have been replaced with a 23 percent Colorado Digital-Divide Elimination Fund (CDEF) charge. CDEF covers a portion of the MNT contractual fees, including Qwest project management fees, Aggregated Network Access Point (ANAP) fees, state core switch (MGX) maintenance and management fees, LATA Crossing, edge & Super ANAP circuits, and ISP-layer three development and maintenance fees. The CDEF reflects the geographic disparity of service availability throughout the state of Colorado. By bridging the Digital-Divide the MNT will enable the same digital applications and services in the rural counties as the metropolitan Front Range cities.

In brief, the estimated cost for the proposed network is: Capital: $13.5 million (One time cost). Capital categories include: Telecommunications Installation Costs, Customer Premise Equipment (CPE) Costs, Equipment Installation, Site Preparation. Operating: $13 million annually ($7 million additional spending authority; $6 million of this will be offset by existing expenditures. Operating categories include: Access Costs, Backhaul Costs, Local Loop Interconnect

B. External Sources of Funding

Colorado staff failed to submit the necessary forms by January 17, 2002 to qualify for K-12, telehealth, and library e-rate on a statewide basis. Their staff is looking into qualifying and extending this service to these constituents in the near future. An estimated $15 million of telecommunications discounts are at stake with successful statewide filing.

C. Cost Schedule of Services

During the ensuing contract negotiations, the state gained a key concession: Qwest must eliminate its "backhaul" charges for all customers -- public or private -- located in or near each county seat, including all Internet customers within up to 30 miles of the courthouse.

http://www.state.co.us/mnt/pricing/ATMcellrelay5yearpricing.html
http://www.state.co.us/mnt/pricing/framerelay5yearpricing.html
http://www.state.co.us/mnt/pricing/MNT-TariffRates100201.pdf

I. INDIANA Contact Information

     A. Name of Network: Indiana Higher Education Telecommunications System (IHETS)

     B. Single point of contact: Dave King, Executive Director, dking@ihets.org

     C. E-mail, Phone, Address: communications@ihets.org, 317-263-8900, 714 North Senate Avenue, Indianapolis IN 46202-3112

     D. Primary website: http://www.ihets.org/index.html

II. Network Description

     A. Number and types of clients

The Indiana Higher Education Telecommunication System was created in 1967 by the Indiana General Assembly to permit sharing of educational resources via technology. Its members are Indiana's seven public and 31 private colleges and universities. Partners include K12 schools, public libraries, state government, and public broadcasting.

     IHETS Services and Operations include the Indiana Telecommunications Network (ITN)
Under the auspices of the Intelenet Commission, IHETS operates and manages ITN (formerly the
Access Indiana State Network), which now serves more than 600 college campuses, K-12 schools,
Learning Centers, libraries, and state government offices; **IHETS Television** service is our satellite-based television network, currently four digitally compressed video channels serving 331 downlink sites in Indiana and the region;
IHETS Audio and Video Conferencing Bridge services for member institutions and related constituents; **SUVON**
is an inter-campus telephone network that handles over 13 million minutes of long distance telephone calls each year;
IHETS Integrated Network Services which assist member institutions in linking technological capabilities with the needs of users, including conducting learner and other audience needs assessment, sponsoring stakeholder conferences to gain insight from specific audiences, increasing learner access to educational programs, scheduling and access to Satellite and Backbone networks, promoting educational programming statewide, increasing and facilitating student services, addressing issues of credit transfer, facilitating educational technology-based professional development
Network Customers: http://www.ihets.org/customer/networklinks.html

     B. Technology
     http://www.ihets.org/network/data/indnetmap.html

- Provider
- Circuits
- Capacity

     C. Types of traffic

The IHETS network delivers voice, video and data to most of its constituents. Read this futures document from the Executive Director about changing from ATM to IP video services: http://www.ihets.org/hot/futuredir.html

     D. Security/Privacy requirements

- External
- Internal
- Filtering Requirements

III. Management & Operations

     The IHETS staff directory lists 95 FTE.

     A. Network Operations Center

     B. Operations Staff

     C. Technical Support

IV. Governance

     A. Policies

     http://www.ihets.org/network/video/netutilpol.html?HEADER_printable=1 (IHETS Satellite Television)

     B. Policy Board or Director

The IHETS Board of Directors consists of seven public college and university presidents, one representative of the Independent Colleges of Indiana, the State Superintendent of Public Instruction, one representative appointed by the Governor, one representative from the libraries, and one representative from Indiana's Public Broadcasting Stations.

     Standing IHETS leadership committees are: IHETS Board of Directors, IHETS Management Committee, Indiana Partnership for Statewide Education (IPSE), Integrated Technologies Committee (ITC). The institutional representative on the IHETS Board of Directors appoints the Management Committee representative, typically a senior administrator with ready access to the Board member for consultation and advice. Management Committee members appoint representatives to the ITC and IPSE, whose members designate institutional representation on special task groups or continuing teams reporting to those groups. The chairs of the IPSE and ITC are also members *ex officio* of the Management Committee and often represent their committees at Board of Directors meetings.

C. Statutory Authority and Constraints
http://www.ihets.org/about/legislation/index.html

V. Funding & Billing

A. Internal Sources of Funding

IHETS has a base budget of $7.3 million from the Legislature but does charge for establishing connections to new customers.

Workgroup minutes, Oct. 2000, "The dollar flow for the network is that customers pay Intelenet, which reimburses IHETS for expenses of operating the network. The legislature provided $4 million in start-up funds, Intelenet secured an additional $1.7 million from alternate sources to be repaid, and IHETS loaned another $450,000 to be repaid. Intelenet ran out of funds in February; since then, IHETS has expended approximately $2.8 million for which we have not been reimbursed. We're now reaching break-even point, and as we see a positive cash flow will retire the $2.8 million first, ideally by the end of the fiscal year. However, our ability to meet that goal depends on a very aggressive schedule of bringing on new customers (approximately 85 to 90 per month), and that me not be realistic. We're working with Intelenet to develop a plan through which Intelenet will generate some alternate funds to cover the remaining balance at year's end, and we're also working on ways to improve efficiencies between IHETS and Intelenet."

B. External Sources of Funding

C. Cost Schedule of Services

I. IOWA Contact Information

    A. Name of Network: Iowa Communications Network (ICN)

    B. Single point of contact: Harold "Tommy" Thompson, 1-877/ICN-IOWA

    C. E-mail, Phone, Address: webmaster@icn.state.ia.us; ICN Public Affairs Division, PO Box 587; Johnston, IA 50131-0587; (515) 725-4713, 1-800-645-8860

    D. Primary website: http://www.icn.state.ia.us/index.html

II. Network Description

    A. Number and types of clients

The Iowa Communications Network is a state agency that administers a statewide fiber optics network. Authorized users are identified by the Code of Iowa Chapter 8D. Authorized users include: All accredited K-12 school districts and private schools in the State; All accredited public and private colleges and technical educational institutions; All State Agencies; All Federal Agencies including National Guard Armories; The United States Post Office; Hospitals and Physician Clinics (video and data services only); Public Libraries.

    B. Technology

ICN full-motion video runs at 39 Mbps. ICN offers ISDN circuits in two capacities: Basic rate and Primary rate. Basic rate ISDN uses two 64 kbps bearer (B) channels that carry audio and video and one 16 kbps (D) channel to carry the administrative and signaling necessary to start and end conference sessions. Primary rate ISDN uses 23 64 kbps B channels that carry the audio and video and one 64 kbps D channel to carry the administrative and signaling overhead. The combined channels provide a T1 capacity. The quality of a T1 primary rate video is significantly less than a 39 Mbps ICN full-motion video. However, some applications may find the convenience of Dialable Wideband Video very suitable. Once the ISDN circuits are in place, the client can transmit data over the lines or use the lines for video conferencing. Video conferencing over ISDN lines require dialing into ICN's videoconference bridge to connect sites together. Should more than two sites need to connect, an MCU (multi-conference unit) allows more than one ISDN site to conference together.

In the year 2000, the ICN began to upgrade the backbone of the Network to Asynchronous Transfer Mode (ATM) and MPEG-2 technologies. The switch to ATM technology allows for higher speed transmission of information for video, Internet, and long distance voice communications. Installing MPEG-2 video equipment allows for increased bandwidth efficiency, improving the quality of full-motion, two-way interactive video.

    C. Types of traffic

The Iowa Communications Network makes available voice, full-motion video, and high-speed Internet data connections to all of its constituents and has an IP telephone system installed with a 3-digit dialing scheme.

    D. Security/Privacy requirements

        External

        Internal

        Filtering Requirements

III. Management & Operations

The Deputy Director for Network Operations and Engineering provides management to all technical operations of the Network. The Deputy accomplishes this through major sub-sections of engineering, project management, outside plant, network operations center, service delivery center, and network support center. These sub-sections provide quality network system engineering, service delivery project management, circuit, Internet, Router, and mail hub management. Network engineering includes design of outside plant fiber, transmission system, digital voice, video and data switch systems, and circuit designs.

The Administration Division provides administrative support to the Iowa Telecommunications and Technology Commission (the Network's governing body) and to the ICN itself. These services include personnel management and payroll services, facilities management, administrative services, purchasing/contracting management, and legal services support.

The Public Affairs Division is responsible for disseminating information about the ICN to the Network's employees and users, state officials, the media, and the public. Public Affairs Division members develop and design booklets, newsletters, annual reports, and demonstration videos. Staff members also give tours to visitors to the ICN and presentations to organizations interested in learning about the Network. The division also acts as liaison with the Iowa Legislature. Public Affairs designs and maintains the pages on the ICN Web site.

IV. Governance

    A. Policies

    http://www.icn.state.ia.us/admin/ittc/adminrule/adminrule.htm

    B. Policy Board or Director

During the 1994 legislative session, the Iowa General Assembly passed and the Governor signed SF2089. By statute, a three member Iowa Telecommunications and Technology Commission (ITTC) was established with the sole authority to supervise the management, development, and operation of the Iowa Communications Network and ensure that all components of the network are technically compatible. The duty of the commission is to ensure that the network operates in an efficient and responsible manner for the purpose of providing the best economic service attainable to the network users consistent with the state's financial capacity. Educational users and the use, design, and implementation for educational applications will be given the highest priority concerning use of the network by the ITTC. The commission provides for the centralized, coordinated use, and control of the network.

      C. Statutory Authority and Constraints

V. Funding & Billing

      A. Internal Sources of Funding

In April 1992 and July 1993, the State of Iowa issued Certificates of Participation in the amounts of $96,030,000 and $18,500,000, respectively. The proceeds from these issuances, totaling $88,762,321, were used to build parts I and II of the Iowa Communications Network. In July, 1995, the ICN began the building of Part III of the Network. The costs associated with the construction of Part III of the Network were approximately $94,600,000, with the project ending during FY 2001. Part III additions included school districts, Area Education Agencies and Public Library video connections. The appropriated funding provided for the purchase of equipment for all site additions, as well as the lease costs for the fiber connections to each of those sites. Classroom site facilities were responsible for funding the purchase of the classroom equipment.

The Iowa Communications Network receives its funding from several sources. Receipts for services provided pay for ongoing operations for the Network. There is an annual short fall in revenues due to low rates charged to education users. For Fiscal Year 2002 the General Assembly has appropriated $2,234,330 for subsidization of video rates. The Certificates of Participation, issued to build parts I and II of the Network, require semi-annual interest payments and an annual principal payment. Interest earnings on investments related to the Certificates of Participation pay these requirements. For Fiscal Year 2002 the State of Iowa General Fund, the Tobacco Securitization Fund, and the Pooled Technology Fund, via appropriations, will fund payment of the debt service, which approximates $12,805,000. The Part III sites (schools and public libraries) are connected to the Network by tail circuits leased from private telecommunications providers. Funding for these leases and maintenance for the connections are appropriated from the State of Iowa's Pooled Technology Account. The appropriation for Fiscal Year 2002 totaled $2,234,330.

      B. External Sources of Funding

The ICN also brings additional dollars into the state because of its uniqueness as an infrastructure. During the period of 1992 through 2003, the Federal Government will have invested $155.6 million in projects to use the ICN infrastructure as a test bed. Averaged over the 12-year period of the ICN's existence, this amounts to an annual investment of $12.9 million.

      C. Cost Schedule of Services

Once a month, the ICN sends out the video billing invoices and video detail. The video detail tells the title of the class that was used, where it was held, how long it lasted and how many different sites the class viewed. The bills indicate the cost for the ICN to produce the session, which is at least four times the amount billed to the user. If the user is eligible for Universal Service Fund discounts (Public k-12 schools, libraries and telemedicine) those discounts are also shown.

http://www.icn.state.ia.us/video/information/videoratehike.htm

I. KANSAS Contact Information

    A. Name of Network: Kansas Research and Education Network (KanREN)

    B. Single point of contact: Doug Heacock**,** Executive Director

    C. E-mail, Phone, Address: heacock@KanREN.net, 785-864-0422, 1802 Engel Road
University of Kansas, Lawrence, KS 66045

    D. Primary website: http://www.KanREN.net/

II. Network Description

    A. Number and types of clients

KanREN is a non-profit consortium of colleges, universities, school districts, libraries and other organizations in Kansas, organized to provide statewide network connectivity in support of education and research. KANREN includes 9 regents state colleges and universities, 12 community colleges, 11 private universities, 14 school districts, and 5 other organizations that are education-related. Membership in the KanREN consortium is open to any Kansas college, university, school district, library, or educational consortium. Other non-profit organizations may qualify for KanREN membership as well, subject to the approval of the KanREN Executive Committee. Most KanREN member institutions also obtain dedicated Internet connections via the KanREN statewide network backbone.

    B. Technology

The KanREN consortium operates a state-wide backbone network utilizing the Internet protocols (IP), with multiple connections to the Internet. This network also provides Internet 2 connectivity for member institutions who belong to the Internet 2 consortium. The KanREN network is built on four points of presence (POPs), located in Manhattan, Lawrence, Kansas City, and Wichita. Member sites connect to one of these POPs via frame relay connections. Individual member site connections are available at bandwidths from 56 or 64 kilobits per second (kbps) to T1 (1.536 Mbps) or multiple T1, including several fractional T1 bandwidths. The Manhattan and Lawrence POPs serve sites in the 785 area code area; the Kansas City POP serves sites in the 913 area, and the Wichita POP serves sites in the 316 area.

    The locations of the core routers on the backbone allow us to provide frame relay connections to any of the three local access tariff areas (LATAs) in Kansas, which roughly correspond to the three area code areas (913, 785, and 316). Current tariffs do not allow frame relay traffic to cross LATA boundaries, so we bring frame relay connections to the member sites into a collector within each members own LATA, and cross-LATA traffic is routed across our backbone links, which are not restricted by those tariffs.

    The three northern core routers (KSU, KU, and KUMC) are each connected to a main KanREN hub site in Kansas City, co-located with the Great Plains Network gigaPOP. KanREN's main connection to the Great Plains Network is an OC-3 (155 Mbps); there are DS-3 (45 Mbps) connections from there to each of the northern core sites, and PVCs (permanent virtual circuits) are defined to serve as backbone links between those three sites.

    In the southern part of the state, the WSU core site is connected via dedicated T1 circuits to both the KSU and the KUMC core sites, creating a backbone ring capable of serving all parts of the state.With the exception of the universities at the four core sites, each member site is connected to the KanREN backbone via local loop circuits into the Southwestern Bell frame relay network. PVCs are defined to create connections into the appropriate core router from each member site. Each core site has one or more frame relay collector circuits to collect the traffic from member sites.

    C. Types of traffic

KanREN mainly carries high-speed data and Internet traffic over an ATM backbone.

    D. Security/Privacy requirements

- External
- Internal
- Filtering Requirements

III. Management & Operations

    A. Network Operations Center

The Network Control Center (NCC) at the University of Kansas monitors local and wide-area network conditions for the university and for the Kansas Research and Education Network (KANREN).

    B. Operations Staff

The KanREN staff consists of five positions: Executive Director, Director of Network Services .5fte, Network Administrator .5fte, Systems Administrator PT, and an Administrative Assistant.

    C. Technical Support

KanREN member institutions who purchase Internet connectivity through KanREN also get a variety of additional services. These include: Round the clock network monitoring, Virtual Web service, Usenet News access, Domain name service, Proxy Web caching service, Shell accounts for up to four site representatives, Network consulting, problem diagnosis and resolution, Router programming and maintenance, and Access to KanREN's intra-state backbone. KanREN carries full maintenance contracts on all KanREN routers installed at member sites. KanREN is responsible for

all router maintenance, software upgrades, and, should it become necessary, replacement. Because many educational sites in Kansas need assistance in planning and implementing a functional and reliable wide-area network, KanREN provides complete wide-area network design and implementation services. For prices and other information, see the Intranet Services page.

KanREN contracts with the University of Kansas Networking and Telecommunications group (NTS) for comprehensive network monitoring and statistics-reporting services. We provide online, Web-based usage statistics graphs for every router in our network, allowing our members to easily monitor their own bandwidth usage, and allowing us to plan for bandwidth upgrades as necessary. In addition, KanREN provides primary and secondary domain name service (DNS), and has a tertiary DNS agreement with MOREnet (Missouri's KanREN counterpart). We also are the delegated registration authority for four Kansas Internet domains (cc.ks.us, k12.ks.us, lib.ks.us, and tec.ks.us). KanREN provides Web page hosting for member sites, Web proxy caching service, and Usenet News access for our members, as well. And all of these services are provided at no extra cost for member organizations.

IV. Governance

A. Policies

http://www.KanREN.net/about/bylaws.html

B. Policy Board or Director

The KanREN Executive Committee consists of two members from the regents universities, two members from the community colleges, two members from other colleges and universities, two members from K-12 institutions, and three additional members from other organizations. Elected members of the Executive Committee serve two-year terms.

An executive committee, comprised of representatives from member sites and elected by the membership, governs the organization. Each member institution is asked to identify four people to serve as representatives and contacts for the KANREN staff. An **institutional representative** serves as the primary administrative contact for the organization; the **network support representative** is the primary technical contact; the **user services representative** is the contact for training matters; and the **library representative** is the contact for library-related issues. The representatives are KanREN's contacts at the member site. The institutional representative is typically the person who casts the institution's votes at the annual membership meeting.

C. Statutory Authority and Constraints

V. Funding & Billing

A. Internal Sources of Funding

KanREN bills annually for membership and connection fees. Other billing arrangements can be made to accommodate member institutions' needs.

B. External Sources of Funding

In the fall of 1992 Jerome Niebaum, executive director of Information Technology Services at the University of Kansas, with assistance from staff at KU's Academic Computing Services, submitted a proposal to the National Science Foundation (NSF) requesting over $710,000 in funding to assist the KanREN consortium in establishing the KanREN TCP/IP network over a period of two years. In mid-1993, the NSF awarded over $680,000 to KanREN for staffing, development of the network infrastructure, and connection of member institutions. Today, KanREN is completely funded by membership and connection fees paid by its member institutions.

C. Cost Schedule of Services

http://www.KanREN.net/img/m-services.html

http://www.KanREN.net/about/Rates-FY2002.html

***KAN-ED is another telecommunications initiative underway in Kansas. KAN-ED is a broadband technology-based network designed to connect all K-12 schools, higher education institutions, public libraries, and hospitals to each other and to the outside world. The KAN-ED network would be a partnership between the State of Kansas and the Kansas Telecommunications Industry with the goal of efficiently and effectively delivering a wide range of distance learning opportunities to all corners of the state. KAN-ED is seeking an initial $10 million Legislative appropriation. http://www.kan-ed.org/index.htm

I. MISSOURI Contact Information
   A. Name of Network: Missouri Research and Education Network (MOREnet)
   B. Single point of contact: Bill Mitchell, Executive Director, (573) 884-2666
   C. E-mail, Phone, Address: info@more.net, (573) 884-7200, 3212 LeMone Industrial Blvd., Columbia, MO 65201
   D. Primary website: http://www.more.net/

II. Network Description
   A. Number and types of clients

The Missouri Research and Education Network (MOREnet) is affiliated with the University of Missouri and is Missouri's not-for-profit electronic information network. MOREnet serves 71 higher education institutions, 512 elementary and secondary education school districts, 121 public libraries, all state agencies, and other organizations and government agencies in Missouri. MOREnet is comprised of several projects and programs serving these various groups. MOREnet is not a private Internet Service Provider and does not provide services, including dial-up access, on an individual basis. The Affiliates Program serves all the organizations that MERC does not serve, including private K-12 schools and libraries, non-profit organizations and similar organizations not eligible for other MOREnet managed programs. (Organizations, such as proprietary schools or for-profit organizations, are not eligible to become a MOREnet Affiliate.) Effective July 1, 2000, the MOREnet Consortium, which served the higher education community, private schools, not-for-profit organizations and similar organizations not eligible to participate in other MOREnet projects, officially divided into MERC (higher education groups) and Affiliates (all other organizations).

MOREnet (Missouri Research and Education Network) provides high-speed, reliable Internet access to the state's public sector. In addition to Internet connectivity, MOREnet provides training and technical support needed to make that connection a useful tool. Beyond Internet connectivity, training and technical support, MOREnet provides many additional services. They include access to online reference resources, opportunities to converse with colleagues in technical and topical discussion lists, security education and assistance, videoconferencing and more.

   B. Technology

The high-speed circuits (155 Mbps) connecting the five MOREnet network centers (Columbia, Kansas City, Springfield, St. Louis, and Jefferson City) are based on fail-safe SONET facilities and data circuits from telecommunication providers, which bundle and deliver the connections from the individual MOREnet customer sites. Using ATM and TCP/IP standards, MOREnet's network currently provides dedicated bandwidth for video systems, secure communication among sites and access to Internet2. Internet2 effectively establishes a high-speed research corridor in Missouri (see page 20 for more information about Internet2).

Multi-point conferencing units (MCU), centrally located in Columbia, Mo., support a variety of features that enable videoconferencing for multiple independent organizations. Gateway services provide translation between traditional H.320 video equipment and newer, packet-based H.323 video systems that use the Internet.

   C. Types of traffic

MOREnet's high-performance network can carry most Internet-standard multimedia applications, including data, voice and video. QoS implementation began on customer-edge routers and priority network applications, such as distance learning videoconferencing via H.323, and ensures that essential traffic has adequate bandwidth.

   D. Security/Privacy requirements
   - External
   - Internal
   - Filtering Requirements

III. Management & Operations
   A. Network Operations Center

MOREnet's network operations staff is available 24 hours a day, seven days a week. All elements of the network core infrastructure are monitored around the clock, every day of the year — holidays included. Network operations staff members are notified if an out-of-tolerance condition is detected. Network utilization and specialized network health reports are available to all customers at all times via MOREnet's website. Network status updates are available to all customers at all times by subscription to e-mail discussion lists. Any MOREnet customer can enter into a Service Level Agreement to have their circuit monitored after normal service hours.

   B. Operations Staff

MOREnet Operations services include Security Operations, Database Services, Network Services, Systems & Programming, Technical Support Services, and Video Consulting.

   C. Technical Support

Technical Support has 10 FTE, evenly divided between technical support and training.

IV. Governance
      A. Policies
      http://www.more.net/strat_tech/reports/QoS-TM/QoS-TM-policies.html
      B. Policy Board or Director
      C. Statutory Authority and Constraints

V. Funding & Billing
      A. Internal Sources of Funding
      MOREnet derives approximately $27.1 million yearly from Core funding ($12.1), Elementary and Secondary Education ($6.4), State Libraries ($3.3), and Organization Fees ($5.2). Initial funding and implementation included approximately $33 million from various funding sources within and outside Missouri.
      B. External Sources of Funding
      E-rate reimburses another $7.5 million that is used mainly to fund Grades 3-4 e-MINTS high-tech classrooms.
      C. Cost Schedule of Services
      Fees are assessed for e-mail service and web page hosting using the following schedule:
      http://www.more.net/kinetic/fees01.html

North Dakota
I. Contact Information
        A. Name of Network: SENDIT Technology Services or STAGEnet (Statewide Technology Access for Government and Education Network)
        B. Single point of contact: Jody French, Director of SENDIT Technology Services
        C. E-mail: jody.French@sendit.nodak.edu **Phone:** (701) 231-7208 **Address:**
        D. Primary website: http://www.sendit.nodak.edu

II. Network Description
An official network name was introduced for the North Dakota State Network. SENDIT Technology Services (STS) staff will refer to the state network as STAGEnet, which is an acronym that stands for Statewide Technology Access for Government and Education Network. Customers of STAGEnet will enjoy improved network performance and services at no cost.

The STS (SENDIT Technology Services) serves as a liaison between schools and the Information Technology Department. The Information Technology Department is responsible for STAGEnet infrastructure. The ITD's mission statement is to "provide leadership and knowledge to assist our customers in achieving their mission through the innovative use of information technology." The Information Technology Department (ITD) is responsible for all wide area network services planning, selection, and implementation for all state agencies, including institutions under the control of the State Board of Higher Education, counties, cities, and school districts. ITD is also responsible for computer support services, software development, statewide communications services, standards for providing information to other state agencies and the public through the internet, technology planning, process redesign and quality assurance. ITD has broad responsibilities to all state agencies and the citizens of the state in building a secure state wide area network providing for the aggregation of data, voice, video, and multimedia into a backbone insuring functionality now and in the future.

STS provides distributed networking and information technology support to six defined regions in ND. STS is also an internet support center for K-12 schools. SENDIT Technology Regions include North West, South West, North Central, South Central, North East and South East. Each region has an Information Technology Specialist (ITS) that work together with their region to improve the use and investment of information technology in their schools and help them take advantage of the opportunities that STAGEnet offers.

A. Number and types of clients
STS and StageNet are cooperating with the Education Technology Council (ETC) to provide an anti-virus solution for K-12, working with several state entities to assist schools in implementing video and providing support for the roll-out of Powerschool. STS is also beginning to work more closely with our partners, the Education Technology Council (ETC), the Division of Independent Study (DIS) and the Center for Innovation in Instruction (CII).

B. Technology
DNS services are managed by the North Dakota Information Technology Department (ITD). ITD and the STS network analyst will provide DNS services to K-12 schools.

ITD has contracted with Dakota Carriers Network (DCN) to provide the ATM telephone circuits for the STAGEnet. ITD is also providing the ATM routers needed at each endpoint on the network. ITD personnel will work with DCN to provide support on a daily basis for all state network users.

LAN services provides; an initial site visit to survey existing school equipment and make an equipment upgrade assessment and a question/answer session with the technology committee describing the network implementation process and how the installation will progress. LAN services also provide; a written report/recommendation following the site visit detailing the school's needs and the work to be accomplished, hardware and software purchase recommendations or upgrades, a bid review for the adequacy of the items' bid and pricing, phone support throughout the entire process and a final site visit surveying the completed work and closure of the consulting service. All LAN services are free to schools.

WAN services offer Wide Area Network solutions to connect school building(s) to the Internet. The WAN services package provides; an initial site visit to survey existing hardware/software and determine needs, a WAN planning manual, equipment bid and vendor information, recommendations in a written report, assistance with Internet Protocol (IP) numbers and Domain Administration, router configuration, one station software setup, phone support throughout the entire process, and a final site visit surveying the completed work and closure of the consulting services. All WAN services are free to schools.

SENDIT Technology Services will host e-mail lists on a dedicated server for schools and organizations. The school or organization must be a SENDIT Technology Services member to receive this service. The service is at no charge to SENDIT Technology Services members. SENDIT Technology Services will host your K-12 school or organization web pages on a dedicated server and issue a domain name for your site. Stats are kept for your web pages and clocks and counters are available. The school or organization receives 50 MB of disk space. Additional disk space is available for $50/10 MB a year. This fee is based on the fiscal year and will not be pro-rated.

C. Types of traffic

Recently, schools have been connected to STAGEnet and are enjoying improved network performance and services at no cost. The next STAGEnet project is videoconferencing for distance education. The STAGEnet videoconferencing standard is H.323. H.323 systems can connect with each other for point-to-point conferences, or they can be scheduled on a network such as the North Dakota Interactive Video Network (IVN) for point-to-point or multipoint conferences. H.323 allows the user to establish a videoconference via the Internet using a personal computer equipped with the necessary
software, a small video camera and microphone. H.323 systems can operate at various data rates ranging from 112 KB to 384 KB (1/4 T1) and higher and quality audio and video generally requires a minimum of 384 KB for both sending and receiving. Other videoconferencing standards such as Analog, MPEG 2, and H.320 will be able to communicate through the use of video bridges (multipoint control units) and gateways.

D. Security/Privacy requirements

The STS filter blocks websites described by any of the following categories: Alcohol, Anarchy, Chat, Criminal Skills, Cults, Drugs, Gambling, Hate Groups, Obscene & Tasteless, Personal Ads, Pornography, Public Web Proxies. By default, the filter blocks free web-based e-mail sites. Each district may choose to unblock this category by making their decision known to the STS Help Desk. Note that this decision will affect every computer in the district. It is not possible to filter or unfilter web-based e-mail only for specific machines.

In order to comply with E-rate funding regulations, we may not allow any machine to have permanent and complete unfiltered Internet access. However, your school technology coordinator may obtain a password which allows you to gain less restrictive filtering.

III. Management & Operations
A. Network Operations Center: Information Technology Department is responsible for network infrastructure.

B. Operations Staff: Six regional information technology specialists were hired to provide training for educators on information technology applications and to offer local area networking (LAN) and video consulting. STS also hired a network analyst who assists schools with wide area network (WAN) issues and is responsible for the server side of the anti-virus project.

C. Technical Support: Help Desk staff can answer general questions and offer low level troubleshooting. Network problems involving the event schedule or connections with the bridges and gateways, etc. will be routed to IVN technicians for resolution as quickly as possible. Problems with communications circuits, routers, and other communications devices will be referred to ITD for resolution.

Contact the STS Help Desk with details of the situation/problem. Include school name, contact person, telephone number, and a general description of the problem. The Help Desk is available during the school year from Monday through Friday from 8:00 AM to 5:00 PM CST. Summer hours are 7:30 AM to 4:00 PM CST. After hours support is available Monday thorough Friday from 5:00 PM to 10:00 PM CST and on Saturdays from 8:00 AM to 12:00 PM CST during the school year only. IVN technicians are on-call to provide technical support and trouble shooting from 7:30 am until 10:00 pm Monday – Saturday and 2:00 – 8:00 pm on Sundays.

III. Governance
The Information Technology Department is responsible for network infrastructure.

A. Policies: The six Information Technology Specialists (ITSs) have been busy visiting the schools within their regions. In each school district, they met with approximately three people who make up Implementation Teams.
The teams consist of superintendents, principals, technology coordinators and teachers. Through these teams, they inform the schools of the training and support programs that STS has available for K-12 and assist them in taking advantage of the opportunities provided by the STAGEnet.

B. Policy Board or Director:
Access to and use of SENDIT Technology Services is a privilege and should be treated as such by all users. Misuse of the system is considered a violation of system policy and may also be a violation of law. SENDIT has developed a policy that applies to all users of the SENDIT Technology Services computer system.
This Acceptable Use Policy can be accessed at http://www.sendit.nodak.edu/services/aup1.htm.

D. Statutory Authority and Constraints:
With the 1999 legislation, a Chief Information Officer (CIO) appointed by the Governor oversees the department and all that it administers. ITD has broad responsibilities to all state agencies and the citizens of the state in building a secure state wide area network providing for the aggregation of data, voice, video, and multimedia into a backbone insuring functionality now and in the future. The CIO is a member of the Statewide Wide Area Network Advisory Committee that advises ITD with respect to planning and implementation of the state's wide area network. The CIO is also an ex-officio member of the legislature's Information Technology Committee that reviews the ITD and its business plan, and statewide technology standards, policies, plans, and projects

V. Funding & Billing
A proposal was submitted to former Governor Schafer to provide support for the use of videoconferencing by K-12 schools. Gov. Schafer included funding for the proposal in his budget, and Governor Hoven has also included funding for the proposal with some changes. The proposal and budget submitted to Gov. Schafer can be viewed at
http://www.sendit.nodak.edu/ppboard.htm (middle section of page).

The Information Technology Department has signed an exclusive contract with Qwest for discounts of up to 37% for schools, state agencies higher education, cities and counties. Schools who receive direct funds (such as ETC funds) are required to purchase from the state contract with Qwest.

A. Internal Sources of Funding
STS received additional legislative funding to launch an initiative to assist K-12 schools in using STAGEnet.

B. External Sources of Funding
The state of North Dakota applied for all e-rate wide area network discounts for K-12 (i.e. ATM-T1, Internet service, state WAN equipment). Local school districts will apply for discounts on services unique to the local school district (i.e. telephone service, long distance service, internal connections).

The North Dakota Educational Telecommunications Council (ND ETC) has requested funding to provide technology grants to K-12 schools during the 2001 and 2002 school year. The ETC will determine the general types of projects they will fund, and how the legislative appropriation will be allocated among the grant recipients.

C. Cost Schedule of Services

Oklahoma

I. Contact Information

    A. Name of Network: OneNet: Oklahoma's Telecommunications Network

    B. Single point of contact: James Deaton, Chief Technology Officer

    C. E-mail: jed@onenet.net Phone: (405) 225-9444

        Address: 655 Research Parkway, Suite 100 or Post Office Box 108800 Oklahoma City, OK 73104

    D. Primary website: http://www.onenet.net/

II. Network Description

OneNet, Oklahoma's telecommunications and information network for education and government is a Division of the Oklahoma State Regents for Higher Education operated in cooperation with the Oklahoma Office of State Finance. This comprehensive network is utilizing fiber optics and wireless technologies to transmit video, voice and data throughout Oklahoma, the nation and the world. OneNet is not a state-owned utility, but rather a state lead partnership among telecommunications companies, equipment manufacturers and service providers. Upon its implementation, OneNet focused on establishing the necessary hub sites throughout Oklahoma to provide the infrastructure necessary to support the high-speed telecommunications network. In addition, it moved aggressively to establish an equitable rate structure and enroll customers. This electronic linkage is made possible through a partnership between the State of Oklahoma and private telecommunications companies - enabling OneNet to negotiate reduced rates and utilize established, private communications networks. The result of this partnership is millions of dollars in savings to Oklahoma taxpayers as well as the rapid development of a telecommunications infrastructure that is one of the most comprehensive in the nation.

A. Number and types of clients

OneNet's state-of-the-art technology and dedicated staff currently provide high-speed communications to a variety of Oklahoma entities such as: public and vocational-technical schools; colleges and universities; public libraries; local, tribal, state and federal governments; court systems; rural health care delivery systems; and programs engaged in research.

B. Technology

OneNet has built telecommunications carrier class facilities throughout the state of Oklahoma. Currently, 42 hub sites provide the framework for the state's integrated telecommunications network. They are located on campuses of the state system of higher education and at several area career and technology centers. Geographically, OneNet covers much of rural Oklahoma, from Guymon to Altus from Idabel to Miami.

Every OneNet hub site is served by a full DS-3 telecommunications circuit, has its own SUN computer system, has a local bank of modems, and has a Cisco high-performance data router. OneNet's sites are powered by battery backup systems that supply power for hours following any interruption in normal AC current. Each major piece of OneNet equipment is fully redundant. Should components within a device fail, the system will continue to operate and send an alarm to OneNet personnel to facilitate repair to full capacity. OneNet can also provide reflector services for mbone and CuSeeMe videoconference applications. OneNet also provides ListServ and other group collaboration capabilities.

B. Types of traffic

OneNet contracts with ViDeNet to provide virtual networking of video and voice-over-IP to the Internet, Internet 2, and advanced networking communities. OneNet Video Services typically consist of either H.323 Video over IP Service or Streaming Video transmission. H.323 Video over IP provides synchronous, interactive video suitable for distance learning or for face-to-face meetings. Live streaming video is used to reach larger numbers of viewers using their PC, but does not provide for interactive communication.

H.323 Video over IP is typically transmitted at 30 frames per second. H.323 Video traditionally requires a T-1 circuit for digital transmission. This technology typically utilizes only a quarter or half of a T-1 per call -- allowing additional bandwidth for other purposes such as E-mail or other Internet applications. *Streaming video* differs from H.323 video in that participants are not able to engage in two-way interaction with the presenter. In addition, streamed video makes use of the personal computer and Local Area Network of its participants for viewing. OneNet provides *IP address space* for its customers to use with their H.323 video conferencing units.

OneNet provides: IP address allocation, domain name (DNS) registration, electronic mail, World Wide Web (WWW) hosting, file transfers, internet access, news services, proxy services, and information databases. OneNet employs Cisco 7500 series routers at each hub site. These transfer and route data communications services throughout the state. Routers provide for not only TCP/IP data communications, but also a number of other protocols, such as SNA, DEC LAT, IPX and AppleTalk. Banks of high-speed modems are located at each OneNet hub site. These are v.34 modems, which communicate with virtually any type of dial-up communications equipment. OneNet provides "state-of-the-art" computer systems at each OneNet hub site. These high-performance computer systems provide Internet access, electronic mail, storage of World Wide Web information, and other applications, which can take advantage of these distributed resources.

D. Security/Privacy requirements:

OneNet is committed to providing the highest quality security services to its customers and works continually to assure the utmost integrity of its network information. This includes comprehensive review of access and denial of service issues In addition, for security and privacy purposes OneNet provides; Private IP Address Allocation, Network Address Translation and NAT Filtering Service. OneNet is designed to be a secure network operating within Oklahoma, with gateways to external networks such as the Internet, BITNET and others. OneNet will provide security through a variety of hardware and software applications, monitoring both the gateways as well as the internal network.

To safeguard that its network is not compromised, OneNet employs a series of systems to ensure the integrity of customer data such as network monitoring, risk assessment, security policy and procedure development, and user education. Further, research is regularly conducted on the network to identify potential security issues and concerns. Should any instances be found, OneNet staff will communicate the relevant information to the appropriate customers.

OneNet encourages its customers to practice appropriate Network Etiquette (netiquette). However, it is the responsibility of each customer contracted with OneNet to articulate the necessary guidelines and protocols to the individuals they represent. Daily, OneNet staff is made aware of instances where netiquette protocols have been breached and communicate the information to the customers for immediate resolution.

III. Management & Operations

A &B. Network Operations Center and Operations Staff: OneNet will assist both new and existing users with their connections to the network, including equipment configurations, software needs and, where feasible, design of local area networks. OneNet will install routers, channel service units, digital service units and other equipment necessary for connection to the network, as well as installation for all equipment required for operation of the backbone. OneNet will operate a 1-800 help desk 24 hours, year-round to provide assistance relative to both common network applications, such as Chameleon, Netscape, and equipment. OneNet will provide maintenance of all equipment used in the OneNet backbone. If desired, OneNet can provide maintenance to users for their equipment required to connect to OneNet. Through the help desk, OneNet advisors will help identify any OneNet user 's operational difficulty and then follow through with a solution. OneNet staff will work with OneNet users in scheduling courses and videoconferences.

Domain Name System is a mechanism used in the Internet for translating names of host computers into addresses. The DNS also allows host computers not directly on the Internet to have registered names in the same style. Through the use of the hub-site computers, as well as central computers in Oklahoma City and Tulsa, OneNet will provide DNS services to users unable to maintain these systems within their organizations. In addition, OneNet will provide secondary DNS registration where required. OneNet will provide full USENET on-line news services to users and will maintain hosts with sufficient disk capacity to hold one to two weeks worth of news history. OneNet will also provide partial feeds, where appropriate or requested, to K-12 and other groups. OneNet provides an extension of electronic mail, which allows users to electronically send reports to a prescribed list of recipients by using just one group address. This service can be public or private, moderated or not. OneNet will provide customers with up-to-date network, technical and policy information on its Internet site. In addition, the News headlines will be utilized in an effort to keep OneNet customers abreast of any new procedures and services as the come on-line. OneNet will maintain a logging system to record the ever-changing design of the network and associated equipment. The system will also be used to record users of the network, billing information, equipment records, including maintenance, and records of trouble calls and their resolutions.

C. Technical Support: A Toll-free hotline is available to answer questions about OneNet. Use this number to obtain OneNet connection information, order equipment or to reach key OneNet staff. OneNet Customer Support is dedicated to providing the highest possible level of technical support to our customers. OneNet provides its clients with a number of video, data, security, training and support services.

OneNet also offers online assistance in the following areas: **Leased Line Customer Support** Email, Password, Counters, and Web Publishing; **Dial-Up Customer Support** Email, Password, Counters, and Other Technical Support and **Access Numbers.**

IV. Governance

OneNet, Oklahoma's official communications and information network for education and government is a division of the Oklahoma State Regents for Higher Education operated in cooperation with the Office of State Finance.

OneNet Organizational Chart http://www.onenet.net/general/category1/sub4/onenetorgchart.htm

A. Policies Guidelines

OneNet provides access to state, national and international resources through connections from networks outside of OneNet. Therefore, this policy is intended to provide customers with a framework as to the acceptable and unacceptable use of OneNet. In general, it is the responsibility of external networks to enforce their own acceptable use policies. Nevertheless, OneNet will inform its clients of any restrictions on use of networks to which it is directly connected.

http://www.onenet.net/clientservices/category1/sub3/acceptableuse.htm

B. Policy Board or Director

OneNet Advisory Council was formed in 1999. The 16 council members represent several organizations and OneNet users such as common education, career-technical education, higher education, hospitals, state government agencies, and libraries.

C. Statutory Authority and Constraints

V. Funding & Billing
A. Internal Sources of Funding
In 1992 voters in Oklahoma approved a statewide capital bond issue that provided $14 million for the implementation of a statewide telecommunications network. In late 1995, the State Regents approved the OneNet business plan and began implementation in 1996.

B. External Sources of Funding
The OneNet Fee Structure is based upon the bandwidth, or network capacity, desired by each individual client. The type of data and/or video application(s) the client chooses to transmit throughout the network will ultimately determine the overall bandwidth and network capacity required.

Southwestern Bell Telephone and many of the independent telephone companies have each filed OneNet tariffs for 56Kbps and T-1 or DS-1 (1.54Mbps) circuits. The OneNet tariff rates for these circuits are substantially discounted (37% on average) from the state government tariffs. OneNet rates include data-and-video related services, including access to the Internet and other services outlined below. Therefore, only clients paying for OneNet connections are eligible to utilize any of OneNet's value-added services. OneNet will acquire a "tail circuit" for the client and connect the agency to the nearest hub site for network access. The user will be responsible for providing equipment on its premises beyond the termination of the "tail circuit," as well as the cost of long-distance telephone charges for dial-up access to the nearest OneNet hub site. Dedicated connections, however, include line charges in the rate. Clients who purchase dedicated OneNet circuits, such as 56kbps or T-1 circuits, will have unrestricted usage of the disk storage capacity of OneNet's computer systems. Dial-up accounts, however, will be limited to 10MB of storage capacity.

C.   Cost Schedule of Services
Please explore the link below to get current pricing information about OneNet services.
http://www.onenet.net/clientservices/category2/onenetpricingbackground.htm

OneNet Hub Site and Locations Map http://www.onenet.net/general/category1/sub2/hubsite.htm
Dynamic Network Map http://notes.onenet.net/trafficmap/

South Dakota
I. Contact Information
    A. Name of Network: Digital Dakota Network
    B. Single point of contact: Jim Edman
    C. E-mail: jim.edman@state.sd.us Phone:(605) 773-7277 Address: 910 East Sioux Avenue Pierre, SD 57501
    D. Primary website: http://www.ddnnet.net/and http://cts.state.sd.us/

D. Network Description
The Digital Dakota Network (DDN) is a state-supported digital communication system that delivers high-speed data connectivity to all public schools in South Dakota. In addition, the DDN Video delivers high-quality video conferencing capabilities to high/middle school facilities within South Dakota. This system, created by Governor William Janklow, is a cooperative effort between the state of South Dakota and private corporate contributions. The objectives of the DDN Video are to provide a seamless statewide **educational delivery system**. Benefits of using the DDN Video include sharing educational resources; broadening course offerings; allowing teacher collaboration; saving time, travel and other resources; and removing geographic barriers. The DDN video equipment is intended for use in K-12 education. Whether being used for the receipt or delivery of distance learning classes, or as a multimedia instructional tool for on-site classes, each school district will retain local control of the use and scheduling of their DDN Video classroom. This means the school district will determine what classes and programs they will participate in. There may be opportunities via the DDN Video for evening staff development and community educational programs, but this will also require the district to provide access to their facilities for these programs. School districts will not be required to provide after-hours access but are encouraged to make available to their community the potential educational opportunities offered by this network.

Connecting the Schools (CTS) is the program that will install network electronics and video conferencing tools in the K-12 public schools buildings in South Dakota. The CTS project will ultimately connect all educators, up to 75 percent of the K-12 student body, 100 percent of public university students, 9,000 state and local government employees, and the state's libraries to the worldwide resources of the Internet. The goal of the Governor's "Connecting the Schools" project is to connect all of South Dakota's K-12 schools into a single statewide TCP\IP "intranet" to provide classroom education opportunities across the state. The statewide K-12 intranet will provide: internet access, video distance learning opportunities, T1 wide area network connections, file servers & software, network administrator training, LAN switches, E mail, and WWW hosting services.

A. Number and types of clients
Currently, all public school districts (including the 4 vocational technical schools) accredited by the Department of Education & Cultural Affairs are included in the networking. However, private schools, cooperatives, home schools, etc. are not eligible for the network services.

Digital Dakota Network Strategic Partners include; Bureau of Information & Telecommunications, Department of Education & Cultural Affairs, Dakota State University, Enterasys, Cisco, Compaq, Gateway, Microsoft, Mitchell Technical Institute, South Dakota School of Mines and Technology, TIE (Technology In Education), Qwest, and Vtel.

B. Technology
Every public K-12 school building in South Dakota is provided a minimum of one (1) high-speed T1 (1.544 Mbps) telecommunications circuit. Larger schools and districts receive multiple T1s with the largest having OC-3 (155 Mbps) access. This circuit(s) is the building block for access to intra-district resources (specific grade level curriculums), inter-district resources (student management systems, testing applications, etc.), statewide resources (grading system, information databases, e-mail) and Internet-based resources (use your imagination). School buildings with grades 1–6 are served with a frame relay circuit that provides data services. Grades 7 – 12 (the buildings with video standards) are served with asynchronous transfer mode (ATM) technology for _dynamic_ delivery of data and video and will provide us a guaranteed level of service. The minimal speed is 1,544,000 bps with an achievable throughput of 1.475Mbps. If the grades are combined (example K-12 in the same building), the intentions are to provide ATM.

The State is going to outsource the WAN management to QWest. Included in this outsourcing is the maintenance of the routers, CSU\DSU & ATM switches. The wide area network will only route the TCP\IP protocol. TCP\IP is the "language" that all of the computers on the Internet talk. Any traffic going across the WAN must be in a TCP\IP format. The process of converting any non-TCP\IP protocols to TCP\IP for delivery across the WAN is the responsibility of the school district.

Internet access is an integral part of the DDN. The initial design incorporated 39 Mbps of bandwidth split amongst the three (3) core sites. This was increased for a total of 94Mbps.

C. Types of traffic
Each school district has been provided a group video conferencing system (VTEL LC5000) or DDN Video connections have been made to compatible video conferencing equipment already in place at the school. The technology uses video CODECs (Coder/Decoder) and digital compression to provide fully interactive (two-way) videoconference services utilizing a portion of the bandwidth capacity on the Digital Dakota Network (DDN). Videoconference rooms are connected either in a point-to-point (one site to one site) conference or a multi-point conference by network control equipment located in Pierre or Mitchell. The DDN Video can link a number of sites into a single conference, or several combinations of sites into separate simultaneous conferences. The state's program will be H.320 based. The room systems will be based on H.320 video standards. Any desktop equipment will be H.323 based.

D. Security/Privacy requirements
Security and Tech support is offered to the DDN by the BIT and provide help of all school districts that are part of the Digital Dakota Network. Their services include support concerning servers, network switches, routers, tape backups, network or design problems, monitor utilization of T1 circuit at schools (MRTG).

The DDN staff monitors the activity of the network through computer driven menus that show only the status of the connection. The signals can be intercepted at the local sites after they are decoded. If they have a security concern, they are to check with the local site prior to the conference to see if additional monitoring has been added to the standard VTEL setup. In addition, the DDN will not schedule an additional site(s) to observe or monitor a conference without permission from the originating site.

III. Management & Operations
A. Network Operations Center: Digital Dakota Network (DDN) includes a network administrator, technical and operations staff. The network administrator supervises the overall functions of Digital Dakota Network (DDN). The DDN Video has combined some of the State's finest resources available to provide a competent and experienced staff for the operation of the network. Day-to-day operations of the DDN Video will be the joint responsibility of the Mitchell Technical Institute (MTI) and the State of South Dakota.

B. Operations Staff: The staff provides policy implementation, centralized scheduling, billing, and reporting functions as for operation of the DDN Video. This group of trained professionals will assist schools in maximizing the impact of this valuable new tool for education.

C. Technical Support: MTI and the Bureau of Information and Telecommunications will employ technicians trained and certified in all aspects of compressed digital video. Offices will be maintained in Mitchell and Pierre to provide a timely response to problems encountered in the use of the network. This technical staff will be the first line assistance to schools operating as part of the DDN Video.

IV. Governance
A.   Policies
The video conferencing policy manual's purpose is to outline the administration, use, operations, and scheduling procedures regarding the video conferencing portion of the Dakota Digital Network (DDN). Policies governing the use of DDN For-Fee sites (former RDT Network sites) are covered by a separate attachment pertaining to the use of these locations.

DECA and DDN Video administrative staff may change this policy as needed and will provide final authority in the interpretation of the policy. The text of the policy will be periodically reviewed by the DECA to assure continued applicability as the project grows and matures.

B.   Policy Board or Director
Under the Governor's direction, the Bureau of Information & Telecommunications (BIT) / Division of Telecommunications is the project manager. The BIT home page on the WWW is located @ http://www.state.sd.us/state/executive/bit/index.htm. Furthermore, resources from many entities within state government are being utilized.

C. Statutory Authority and Constraints

V. Funding & Billing
The one-time equipment and identified recurring services are provided by the state. There are no direct billings to the School districts. The state will also apply as a single consortium to take advantage of the federal funding.

Building local infrastructure, providing standardized equipment, establishing wide area network facilities, offering hardware and software training, network management and reporting of the WAN infrastructure and finally, most importantly – <u>all</u> of this is done with state financial resources. Local school costs are focused solely towards the daily support requirements unique to their educational community.

DDN Network Layout Diagram http://cts.state.sd.us/ddnlayout.htm
DDN Installation Status http://cts.state.sd.us/images/ctstatus.gif
DDN Video Installation Progress Map http://cts.state.sd.us/images/ctstatus.gif

Wyoming
I. Contact Information
      A. Name of Network: Wyoming Equality Network (WEN)
      B. Single point of contact: Tom Engbretson**,** Network Manager of Telecommunications
      C. E-mail: tengbr@state.wy.us **Phone:** (307) 777-5089 **Address:** Emerson Bldg. 2001 Capitol Ave, Room 237 Cheyenne, WY 82002
      D. Primary website: http://www.k12.wy.us/

II. Network Description
The **Wyoming Equality Network** is a statewide, high-speed data and video network that will connect all Wyoming public schools and give communities capability for telemedicine, economic development and community outreach applications as well as access to the Internet. The Wyoming Equality Network is the network, which was created through the state's agreement with Quest and enabled the state to provide telecommunications capabilities to schools and related entities. In addition, WEN is an ATM backbone connecting 3 com switches.

The Wyoming Department of Education (WDE) is essentially the "owner" of the network. Wyoming's Department of Administration and Information (A & I) provides central support to the state and will act as the intermediary between the school district and their main provider for purposes of ordering and making payments for enhancements and Quest Internet access service. The Information Technology Division (ITD) provides MIS applications, computer center, and telecommunications support for the state. ITD manages the network, bills WDE for services when appropriate and serves as the collect agent for WEN. A & I Telecommunications Division manages the scheduling of video conferencing, bills select entities for services provided, and oversees the contract with their main provider, Quest.

II. Number and types of clients
 The WEN supports all schools via their intranet. There are 48 school districts in Wyoming. Schools include all grade schools, middle schools, high schools, junior/community colleges and universities.

Any entity wanting to connect to the WEN needs to have permission from the Network/Security Policy Group. The entity wanting access needs to be sure that the application needing access is in compliance to all standards of the network. To include – any application brought to the WEN needs to be capable of using this transport, any necessary changes needed to be done are the responsibility of the entity needing transport or services, any application brought to the WEN will be monitored to insure that latency to the network is not being compromised and any entity needing services by the WEN needs to adhere to appropriate security issues.

B. Technology and C. Types of Traffic
QWEST, Inc. was awarded the contract to install and maintain this network. Quest shall design and install a network capable of providing the specified service to the schools indicated in the Site Agreements, as appropriate. The network design and operation shall be substantially similar to that outlined in Quest's Proposal. Quest proposed modification or deviation from the network design shall be permitted on a case-by-case basis provided the services to be provided to the schools remain as proposed and the changes result in no additional costs to the State. The decision to allow a deviation from the network design shall be solely within the State's discretion. Installation work shall be performed in coordination with the State. The State may designate an order of schools to which Quest shall follow in completing the necessary installations.

Wyoming Equality Network circuits consists of a combination of Asynchronous Transfer Mode Cell Relay technology (ATM), Frame Relay Service (FRS), and private circuits. ATM provides customers with high-speed, low-delay information transfer capacity, which supports applications that require near real-time mixed media (i.e.,data, video, image, voice) communications among multiple locations. ATM supports transmission speeds of either up to 45 Mbps, or up to 155 Mbps. FRS provides interconnection of Local Area Networks (LANs) and/or computers, with maximum transmission speeds of 1.544 Mbps. FRS enables users to allocate circuit bandwidth to applications as needed up to the maximum bandwidth purchased, rather than assigning fixed channels for specific applications. FRS requires certain CUSTOMER Provided Equipment ("CPE") not provided as part of the FRS to accumulate and properly format CUSTOMER data transmission. The WEN offers DS3 connections between aggregated points in Wyoming, which are usually located at high education institutions.

The choice of Internet Service Provider (ISP), if any is the responsibility of the school district. The school district may choose the Internet service available from any independent ISP available to the district. All costs for Internet service are the responsibility of the school district, regardless of the identity of the selected ISP. It is the responsibility of the school districts to require provision of these security services by ISPs under contract. It is the responsibility of the school districts to require adequate performance/reliability characteristics for ISP's. Quest Managed Data Service will not manage/monitor any communications equipment by other ISPs. Any ISP has the option of serving one or more school districts by connecting directly to the WEN at the Emerson Building in Cheyenne, Wyoming and using WEN circuits to access the district(s). Any ISP may connect directly to individual school districts but that connection may only serve that particular district, and cannot be used to serve other districts over WEN circuits. All ISPs must provide NAT external to the WEN. All ISPs must supply IP addresses for dynamic and static translation.

The choice of Application Service Provider (ASP), if any is the responsibility of the school district. The school district may choose the (ASP) service available from any independent ASP available to the district. All costs for (ASP) services are the responsibility of the school district, regardless of the identity of the selected ASP. It is the responsibility of the school districts to require provision of these security services by ISPs under contract. It is the responsibility of the school districts to require adequate performance/reliability characteristics for ASP's. The ASP cannot adversely cause latency to other WEN entities. Validation of cause will be reason for termination of services. All new ASP applications shall be discussed with the Network/Security Policy Group for review. Any ASP application is the sole responsibility of the ASP to ensure reliability and delivery of product to districts. If the application service requires additional dedicated services or bandwidth, it is the responsibility of the district to provide.

D. Security/Privacy requirements
It is recognized by the Network/Security Policy Group that security is critical to the success and stability of the Wyoming Equality Network. Security components include both access control between the WEN Intranet and the public Internet and access control between IP entities within the Intranet. A security advisory team will consist of members from K-12, the community colleges, the University of Wyoming, and the Wyoming Department of Administration & information.

Any and all transmission paths between the WEN Intranet and the public Internet are required to have a security mechanism in place that will provide access control to IP entities within the Intranet. Access control must provide the capability to restrict access to Intranet IP entities from the public Internet on the basis of access method, i.e., TCP/IP protocol Telnet, Rlogin, FTP, HTTP. All security mechanisms referenced above must provide an audit trail for security violations that may be electronically accessed by the school districts. It is the responsibility of each school district to develop a security policy for IP entities residing on their local area network. This security policy must include the name and IP address of the entity and the access control desired, i.e., Telnet or HTTP access from the public Internet. Security policies will be implemented on the security devices. Any and all security functions and devices residing on the district local area network are the responsibility of the local school district. It is highly recommended that all school districts implement security mechanisms, including virus scanning, on their local area networks.

The school district is responsible for the physical security of the network equipment located on the premises of schools within the school district's jurisdiction. At each site, WEN has implement cache boxes for site blocking and management. The WEN also uses the Nokia Firewall/VPN appliance which includes market-leading FireWall-1® software from Check Point Software Technologies. This allows organizations to deploy a single, integrated solution; providing secure Internet communications and access control for networks.

III. Management & Operations
A. Network Operations Center: Network operation, network management and monitoring are maintained by Quest Network Management Services out of Minneapolis. Their services include, but are not limited to, mapping, trouble tickets, performance measurement, and reporting.

B. Operations Staff: On-site maintenance of the network product and equipment will be performed only by Quest personnel. Quest employs three field agents in Wyoming and service managers. WEN routers are maintained online and a local data technician augments Quest. School districts must provide a central point of contact (POC) for problem resolution.

C. Technical Support: The school district agrees that it shall allow WDE representatives, Quest and Quest subcontractors access to the school district's facilities as necessary to install and maintain the network equipment. The school district shall have sites in which network components will be installed prepared as provided in the District Site Profile. The school district shall indemnify WDE for any increased costs the state incurs as a result of the school district's improper or incomplete site preparation or as a result of changes in any floor plans provided by the District.

IV. Governance
The WEN Network Policy Document outlines policy for the Wyoming Equality Network (WEN). The WEN policy group, will be referred to as the Network/Security Policy Group (N/SPG), developed it. This group is comprised of members from the K-12 school districts, the Wyoming Community College Commission, the University of Wyoming, the Wyoming Department of Administration & Information, and the Wyoming Department of Education. The purpose is to provide configuration and operational guidelines for the WEN. A & I will serve as the central point of contact for the WEN for all configurations and operational issues. A strategic management team will serve as the final decision authority relating to compliance with requirements specified in the policy. All compliance questions and appeals should be directed to the Network/Security Policy Group.

V. Funding & Billing
Quest, the local exchange carriers and the independent exchange carriers will bill WDE for the installation, maintenance and use of the Basic Service, and WDE shall pay for the installation, maintenance and use of the Basic Service. If the district chooses to use !NTERACT, A&I will forward the school district's order for the !NTERACT services to Quest. Quest will bill A&I for the District's use of the !NTERACT service, and A&I will bill the school district. A&I will pay Quest for the district's use of the !NTERACT service after the District pays A&I. If the District chooses to obtain enhancements, A&I will forward the district's order for enhancements to Quest, and Quest will work directly with the school district in providing the enhancements. Quest will bill A&I for

the school district's enhancements, and A&I will bill the school district. A&I will make payment to Quest for the school district's enhancements after the school district pays A&I.

Any school district utilizing network address translation (NAT) is responsible for any additional costs associated with implementing NAT on the network connection point (NCP) router. The WEN is an Intranet utilizing the Internet Protocol. The NCP (network connection point) routers purchased under the state contract route IP and may not include, under contract purchase price, any other protocol stack. In order to efficiently utilize bandwidth for IP traffic, all non-IP protocols are required to run on separate, dedicated permanent virtual circuits (PVCs). All costs for running non-IP protocol stacks are the responsibility of the school districts.

Basic Service for high schools means the service necessary to provide high schools with the capability to effectively accommodate integrated data and video services without degradation of quality for either application using an integrated transmission rate of a minimum of 1.544 Mbps. Basic Service for schools and entities other than high schools means the service necessary to provide the schools with the capability for data communications using a transmission rate of a minimum of 56 Kbps.

Enhancements are optional services and equipment, above the Basic Service, which the District may purchase from Quest, through the Wyoming Department of Administration and Information; at the school district's own cost.

C. Cost Schedule of Services

Wyoming Equality Network Map of Completion http://www.k12.wy.us/wen/index.html
WEN Video Conferencing Costs http://www.k12.wy.us/wenvideo/old_site/WENVideo/WENVideo/index.html

WEN Network Policy Document http://www.k12.wy.us/technology/poldoc.pdf
Wyoming Educational Technology Plan http://www.k12.wy.us/technology/wyedtec.htm